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Remarks/Arguments

Applicants respectfully request favorable reconsideration of the subject application, particularly in view of the above amendment and the following remarks. Claims 1-13 are currently pending in the subject application. Applicants respectfully urge that there is no additional fee for this amendment as the number of independent claims and the total number of claims in the application remain unchanged.

Applicants have amended Claims 1 and 7 to provide clarification of limitations “sealable means” and “separation means” recited therein. Specifically, in addition to introducing at least one volatile liquid sample into a transparent reactor vessel, the “sealable means” have also been indicated as sealing the at least one volatile liquid sample within the transparent reactor vessel. The recited “separation means” have been indicated as maintaining a separation between a sorbent and any soil/NAPL complex present in the transparent reactor vessel. Applicants respectfully urge that this amendment is fully supported by the application as originally filed and, thus, incorporates no impermissible new subject matter into the application.

Claims 1-13 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention and as being incomplete for omitting essential structural cooperative relationships of elements, which omissions the

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Examiner indicates amounts to a gap in the necessary structural connections. The Examiner indicates that Claims 1 and 7 recite a “sealable means” and a “ separation means” and it is unclear as to whether Applicants intend to invoke 35 U.S.C. 112, sixth paragraph, for claim interpretation and examination purposes. Applicants respectfully urge that the above amendment fully addresses this issue and, thus, overcomes this rejection.

The invention claimed by Applicants is a *method and apparatus for determining release rates of volatile contaminants from soils*. The apparatus comprises a transparent reactor vessel comprising sealable means for introducing at least one volatile liquid sample into the transparent reactor vessel and sealing the at least one volatile liquid sample within the transparent reactor vessel, at least one sorbent contained within the transparent reactor vessel, and *separation means for maintaining a separation between the at least one sorbent and any soil/NAPL complex present in the transparent reactor vessel while permitting passage of solvent soluble constituents of the volatile liquid sample to be sorbed by the at least one sorbent*. As described beginning at Page 6, line 21 of the specification of the subject application, the apparatus as claimed enables contacting soil with a liquid so as to maintain *a gas headspace volume equivalent to virtually zero percent of the total contents of the reactor vessel* and for employing a sorptive resin for measurement of

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the contaminant releases from the soil into the liquid phase, e.g. water, of the reactor vessel without direct contact of the resin with the soil solids. Applicants respectfully urge that the prior art relied upon by the Examiner for rejection of the subject application neither teaches nor suggests the invention claimed by Applicants.

Claims 1-6 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Petty et al., U.S. Patent 6,478,961 B2 (hereinafter “the Petty et al. patent”) in view of Devon, U.S. Patent 5,138,101 (hereinafter “the Devon patent”). This rejection is respectfully traversed. The Petty et al. patent teaches a sampling device, shown in Fig. 1, for sequestration and concentration of polar organic chemicals from water. The device includes a sealed *microporous* hydrophilic polymeric membrane enclosure, in which enclosure is contained a mixed sequestration phase capable of transforming dissolved polar organic chemicals into non-mobile (sorbed) species, which accumulate in the device throughout the period of exposure of the device to the contaminated water (Col. 3, lines 41-46). Applicants respectfully urge, however, that the Petty et al. patent neither teaches nor suggests the suitability or capability of the membrane for maintaining of a separation between a sorbent disposed within a transparent reactor vessel and any soil/NAPL complex present in the transparent reactor vessel while permitting passage of solvent soluble constituents to be sorbed by the sorbent as required of the separation means of the invention

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claimed by Applicants. Nor does the Petty et al. patent teach or suggest an apparatus as claimed by Applicants comprising a transparent reactor vessel, a fact acknowledged by the Examiner.

The Devon patent is relied upon by the Examiner for teaching that the use of a transparent reactor vessel or glass flask including sealing means comprising a septum and a magnetic stirring means are well known in the art of analytical chemistry in performing chemical extraction procedures. Thus, the Examiner argues that it would have been obvious to one of ordinary skill in the art to apply the teachings of the Devon patent with respect to the use of transparent reactor vessels, sealing means and magnetic stirring means to arrive at Applicants' claimed invention. Applicants respectfully urge, however, that the combination of the teachings of the Petty et al. patent and the Devon patent would not result in the apparatus of the invention claimed by Applicants because *the references, alone or in combination, neither teach nor suggest an apparatus employing separation means for maintaining a separation between a sorbent disposed within the transparent reactor vessel and any soil/NAPL complex present in the transparent reactor vessel while permitting passage of solvent soluble constituents to be sorbed by the sorbent as required by Applicants' claimed invention.* Thus, Applicants respectfully urge that the Petty et

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al. patent and the Devon patent, alone or in combination, do not render Applicants' claimed invention obvious in the manner required by 35 U.S.C. 103(a).

Claims 7-13 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Hayes et al., U.S. Patent 6,591,702 B2 (hereinafter "the Hayes et al. patent") in view of the Petty et al. patent discussed herein above and further in view of Ray et al., U.S. Patent 5,470,535 (hereinafter "the Ray et al. patent"). This rejection is respectfully traversed. The Hayes et al. patent teaches a method for identifying and characterizing contaminated soils and sediments involving subsurface vapor pressure mapping of vapor pressure measurements made at a plurality of subsurface soil sampling locations of a site. Contaminant mobility at the subsurface soil sampling locations having a peak vapor pressure is then determined and contaminants in fast release compartments and slow release compartments in the contaminated soils and sediments identified. Thereafter, the fraction of contaminants in the fast release compartments and the slow release compartments is determined. The Hayes et al. patent is relied upon by the Examiner as teaching the use of a Zero Headspace Extraction vessel for the disclosed method. The Examiner acknowledges, however, that the Hayes et al. patent *does not teach* the use of a separation means or containment means for holding the sorptive resin during use. Rather, the Examiner relies upon the Petty et al. patent as teaching these elements.

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Applicants' arguments with respect to the Petty et al. patent as set forth herein above in response to the rejection of Claims 1-6 are equally applicable to this rejection and, thus, will not be repeated other than to reiterate that *the Petty et al. patent neither teaches nor suggests the suitability or capability of the membrane disclosed therein for maintaining a separation between a sorbent disposed within a transparent reactor vessel and any soil/NAPL complex present in the transparent reactor vessel while permitting passage of solvent soluble constituents to be sorbed by the sorbent* as required of the separation means of the invention claimed by Applicants. The apparatus of the Petty et al. patent is deployed in aquatic systems and application of the device to soil/NAPL complexes is neither taught nor suggested by the Petty et al. patent.

The Ray et al. patent teaches a piston-type zero headspace extraction device comprising an open-ended cylinder 10 in which a piston 12 is slidable in sealing engagement with the cylinder maintained by sealing rings 14. The upper and lower ends of the cylinder have peripheral lips 16 and 18, respectively, to which a top flange 20 and a bottom flange also respectively, are removably secured by bolts 24 (Col. 4, lines 19-25; Figs. 1-3). Agitation of the device is accomplished by turning the vessel end over end in a rotary agitation apparatus (Col. 4, lines 51-55). The Examiner argues that the combination of the Hayes et al. patent, the Petty et al. patent

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and the Ray et al. patent teaches all of the recited structure of the apparatus provided in the claimed method, which merely recites the conventional operation of the apparatus, based upon which the Examiner concludes that it would have been obvious to one of ordinary skill in the art to perform the method recited in the instant claims upon the apparatus of the Hayes et al. patent, the Petty et al. patent and the Ray et al. patent, as such is the intended operation of the apparatus. Applicants respectfully disagree.

Successful performance of the method of the invention claimed by Applicants requires an apparatus having elements which enable the method to be successfully performed. One such element is separation means for maintaining a separation between a sorbent disposed within a transparent reactor vessel and any soil/NAPL complex present in the transparent reactor vessel while permitting passage of solvent soluble constituents to be sorbed by the sorbent. Nowhere do the Hayes et al. patent, the Petty et al. patent and the Ray et al. patent, alone or in combination, teach or suggest an apparatus having the requisite elements. Accordingly, absent teachings or suggestions of an apparatus having the requisite elements for carrying out the method of the invention claimed by Applicants, Applicants respectfully urge that the Hayes et al. patent, the Petty et al. patent and the Ray et al. patent, alone or in

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combination, do not render the method of Applicants' claimed invention obvious in the manner required by 35 U.S.C. 103(a).

Response to Examiner's Arguments

In response to the previous Office Action, mailed 27 October 2005, Applicants argued that it would not have been obvious to one skilled in the art at the time of the invention to combine the teachings of the references relied upon by the Examiner for rejection of Claims 1-6 under 35 U.S.C. 103(a), i.e. Petty et al., U.S. Patent 6,478,961 B2 and Devon, U.S. Patent 5,138,101, to provide the invention claimed by Applicants in the subject application. One of the underpinnings of this argument was Applicants' assertion that the references, which *must suggest the desirability and thus the obviousness of making the combination* taught by the references, did not, in fact, suggest such desirability. As noted by the Examiner, the courts have held that "[o]bviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination." The courts have also held that the suggestion to modify the art to produce the claimed invention need not be expressly stated in the cited references in order to establish obviousness and that the motivation to combine references stems from three possible sources: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art.

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Applicants respectfully urge that, considering the nature of the problem to be solved and the teachings of the prior art, one skilled in the art would not be motivated to combine the teachings of the references relied upon by the Examiner for rejection of the rejected claims. Applicants further respectfully urge that, were one skilled in the art to combine the teachings of the cited prior art, the result would not be the invention claimed by Applicants.

With respect to the nature of the problem to be solved, Applicants acknowledge that numerous membrane separation and extraction processes as well as chemical extraction processes are known to those skilled in the art and that some of these processes and devices for carrying out the processes are taught by the prior art relied upon by the Examiner for rejection of the subject application. It is, however, also clearly the case that no single extraction process or extraction apparatus is suitable for use in all applications. Thus, while the nature of the problem to be solved could broadly be defined as an extraction process, Applicants respectfully urge that such a definition, given the multitude of existing separation membranes and materials to be extracted, is much too broad for the purpose of establishing the obviousness of a particular inventive extraction process or apparatus.

The Petty et al. patent teaches a sampling device, shown in Fig. 1, for sequestration and concentration of polar organic chemicals from water. That is, the

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device is employed in aquatic systems containing polar organic chemicals. In contrast thereto, the invention claimed by Applicants is employable in soils for the purposes of testing the soils for contaminants and for determining the release rates of contaminants from soils. Thus, not only is the problem solved by the invention claimed by Applicants substantially different from the problem solved by the device of the Petty et al. patent, but also the media involved are substantially different.

In simple terms, the sampling device of the Petty et al. patent, a plan view of which is shown in Fig. 1 and a side elevational view of which is shown in Fig. 2, comprises only three basic components: membranes, stainless steel washers, and threaded studs and wing nuts, more particularly, two *microporous* membranes (designated as element 20) forming an enclosure between them in which is contained a mixed sequestration phase capable of transforming dissolved polar organic chemicals into non-mobile (sorbed) species, two stainless steel washers (designated as element 12) and means for clamping the two stainless steel washers together so as to securely sandwich the membrane between the two stainless steel washers in the form of threaded studs 16 and wing nuts 18. Assuming that the device of the Petty et al. patent corresponds to the separation means of Applicants' claimed invention, nowhere does the Petty et al. patent teach or suggest disposition of the device in a

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reactor vessel, much less a transparent reactor vessel, as required by Applicants' claimed invention.

A further requirement of the separation means of the invention claimed by Applicants is the maintaining of a separation between a sorbent disposed within the transparent reactor vessel and any soil/NAPL complex present in the transparent reactor vessel while permitting passage of solvent soluble constituents to be sorbed by the sorbent. Applicants respectfully urge that the Petty et al. patent neither teaches nor suggests that the disclosed membranes are capable of providing the separation of sorbent and soil/NAPL complex while permitting passage of solvent soluble constituents to be sorbed by the sorbent as claimed by Applicants. The only thing taught by the Petty et al. patent regarding the performance of the disclosed membranes is the diffusion of polar organic chemicals from ambient water through the pores of the membranes into the mixed sequestration phase disposed within the enclosure formed by the membranes (Col. 5, line 11-27).

The Examiner acknowledges that the Petty et al. patent does not specifically teach the use of a transparent reactor vessel or the additional apparatus components of the invention claimed by Applicants. Applicants respectfully urge not only does the Petty et al. patent not teach or suggest the use of a transparent reactor vessel containing separation means for maintaining of a separation between a sorbent

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disposed within the transparent reactor vessel and any soil/NAPL complex present in the transparent reactor vessel while permitting passage of solvent soluble constituents to be sorbed by the sorbent as required by Applicants' claimed invention, it also neither teaches nor suggests the use of *any* reactor vessel. Rather, citing the Devon patent as exemplary thereof, the Examiner argues that the use of a transparent reactor vessel or glass flask including sealing means comprising a septum and a magnetic stirring means is well known in the art of analytical chemistry in performing chemical extraction procedures. Thus, the Examiner argues that it would have been obvious to one of ordinary skill in the art to incorporate the use of the apparatus disclosed by the Devon patent with the extraction system of the Petty et al. patent to arrive at the invention claimed by Applicants. Applicants respectfully disagree.

One of the characteristics of the apparatus of this invention is that after introduction of the volatile liquid sample of interest using the claimed sealable means, it is a closed system with the sorbent and sample of interest contained therein. That is, the separation means, sorbent(s) and volatile liquid sample are all fully enclosed within the transparent reactor vessel. In contrast thereto, the device of the Petty et al. patent is not a closed system. That is, it is not disposed within a reactor vessel as required by Applicants' claimed invention, a fact acknowledged by the Examiner. Rather, the device is deployed in aquatic systems and sampling rates are expressed as

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liters per day of water cleared of polar organic chemicals (Col. 5, lines 11-27; lines 34-39). Applicants respectfully urge that application of the teachings of the Devon patent with respect to the use of a transparent reactor vessel or flask would no longer enable the device of the Petty et al. patent to perform its function, namely the removal of polar organic chemicals from aquatic systems. Because isolation of the device of the Petty et al. patent within a transparent reactor vessel would preclude operation of the device for its intended purpose, Applicants respectfully urge that it would be counter-intuitive to one skilled in the art to isolate the device of the Petty et al. patent within a transparent reactor vessel of the Devon patent. That is, there is no suggestion of desirability for combining the teachings of the Petty et al. patent and the Devon patent. Thus, Applicants respectfully urge that one skilled in the art would not be motivated to combine the teachings of the Petty et al. patent with the teachings of the Devon patent to arrive at the invention claimed by Applicants.

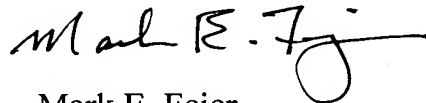
Conclusion

Applicants intend to be fully responsive to the outstanding Office Action. If the Examiner detects any issue which the Examiner believes Applicants have not addressed in this response, Applicants urge the Examiner to contact the undersigned.

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Applicants sincerely believe that this patent application is now in condition for allowance and, thus, respectfully request early allowance.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Mark E. Fejer", with a stylized flourish at the end.

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